Anterior pneumatization of the maxillary sinus – Presenting as a facial swelling

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Abstract

Over pneumatization of the paranasal sinuses is a fairly common finding on computerized tomography; but involvement of a small segment of the maxillary sinus especially the anteromedial aspect is very rare. We report a case of a twenty year old male who presented with a facial swelling. On CT scan, the swelling was found to be due to pneumatization of the anterior part of the maxillary sinus. Surgical treatment was carried out for cosmetic reasons.

Keywords Maxillary sinus · Pneumatization ·
Sublabial

Introduction

The term pneumosinus dilatans denotes the abnormal enlargement of the paranasal sinuses containing air only [1]. It commonly affects the frontal sinus followed by the ethmoid and sphenoid sinuses [5]. Involvement of the maxillary sinus is rare. It can be differentiated clinically and radiologically from a pneumatocele which is a pocket of air in a soft tissue envelope of sudden onset which moves with respiration due to a defect in the sinus wall [1]. In the maxillary sinus the infraorbital recess followed by the alveolar recess have been noted to have a tendency towards pneumatization. According to some authors the anteromedial wall of the maxillary sinus is said to be a more common site [3, 4]. Various reasons have been postulated for the formation of these pneumatized spaces within the paranasal sinuses. Most of these theories though are not convincing.

Case report

A 20-year-old male patient presented with history of swelling over the right side of the face of four months duration. There was no history of trauma, nasal obstruction, pain or epistaxis. The swelling was 3 x 1 cm. and situated below the right infraorbital margin adjacent to the external framework of the nose (Fig. 1a). It was hard in consistency and non-tender. There was no loss of sensation over the cheek. Diagnostic nasal endoscopy was normal. A clinical diagnosis of fibrous dysplasia of the maxilla was made.

CT scan of the paranasal sinuses however showed an area of over pneumatization in the anteromedial aspect of the right maxillary sinus. There was no evidence of maxillary sinus mucosal disease. There was no thickening or thinning of the bone in that region. The anteromedial pneumatized area was seen more prominently in the axial cuts (Fig. 2).

Using a sublabial approach (Fig. 1b), bony cuts were made along the anterior wall and a small chip of bone at the maximum area of projection was removed to allow proper

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Fig. 1a Swelling on the right side of the face over the maxilla adjacent to the nose.

Fig. 1b Sublabial approach exposing the site of prominence where a window of bone was removed.

Fig. 2 CT scan (axial and coronal cuts) showing prominent focal anterior pneumatization of the right maxillary sinus.

alignment of the bony segments. The underlying mucosa was preserved except a small area attached to the bone. There was no postoperative deformity in that region. The region of maxillary ostium was normal. The sublabial incision was closed using absorbable sutures. Histopathology of the removed bone showed normal mature woven bone and normal maxillary sinus mucosa.

Discussion

Although over pneumatization is a common occurrence in the ethmoid, sphenoid and mastoid bones, it is rare in the maxilla. The differential diagnosis of a unilateral swelling over the maxillary region includes fibrous dysplasia, inflammatory process, dentigerous cyst, mucocoele and benign and malignant mucocutaneous or mesenchymal tumours [3, 5]. Computerised tomography will help in identifying the possible underlying pathology especially in the case of anterior pneumatization. Various theories have been mentioned in literature for the formation of pneumosinus dilatans – spontaneously draining mucocoele, presence of a gas forming organism and hormonal causes. These theories are difficult to explain as there is not much evidence for the same [1]. Increased intrasinus pressure on a barometric pressure study in a patient with pneumosinus dilatans raised the possibility of a one way valve mechanism due to redundant mucosa, polyp or inflammatory process [1]. These theories do not explain cases where there is over pneumatization of a focal area within the sinus with no evidence of any underlying / adjacent mucosal disease. Local trauma or surgery before development of a pneumosinus dilatans have been suggestive as causative factor [2].

Pneumatization of focal areas in the maxillary sinus may be an anatomical variant as seen in other areas of the nose and paranasal sinuses like a concha bullosa, pneumatized inferior turbinate or pneumatization of the pterygoid plates, anterior clinoid process or greater wing of the sphenoid. All these anatomical variants are radiological findings and can occur unilaterally. There may be unilateral over pneumatization of all the paranasal sinuses.

The common presentation of a pneumosinus dilatans of the maxillary sinus is facial deformity [5]. The other reported presentations are cheek pain with change in pressure, proptosis, nasal obstruction, sinusitis and eustachian tube dysfunction [2, 3]. The deformity requires surgical correction mainly for cosmetic reasons via a sublabial approach. The overlying bone is removed and the defect reconstructed by reversing the removed bone after removing the attached mucosa, or by a bone graft. If the defect is small it may be left without reconstruction. Care should be taken during the procedure to avoid injury to the infraorbital nerve. A nasoantral window is advocated by some authors based on the one way valve theory [2, 4]. The disease in the region of the maxillary ostium may be an incidental finding

in these cases. The maxillary ostium region has been noted to be normal in cases with pneumosinus dilatans [5] as in our case report.

A middle meatal antrostomy is done only if there is co existing disease leading to obstruction of the ostium or when there are associated symptoms [3].

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